Claims:

1. A method for attaching an optical fiber to a waveguide formed on a PLC, said method comprising the steps of:

securing at least one joint element to a first surface of the PLC, said joint element having a beveled surface such that a gap is formed between the joint element and the first surface of the PLC, said gap being adjacent to an end face of the waveguide, said waveguide end face extending in a plane that includes a transverse surface of the joint element to define therewith a first mating surface;

securing the optical fiber to a support member such that an end face of the optical fiber extends in a plane that includes a transverse surface of the support member to define a second mating surface therewith;

aligning the waveguide end face with the optical fiber end face;

applying an adhesive to an interface defined between the first and second mating surfaces so that the first and second mating surfaces are fixed together, whereby adhesive that would otherwise enter an optical path located between the waveguide end face and the optical fiber end face is diverted into said gap.

2. The method of claim 1 further comprising the step of preparing the first mating surface for reducing reflections therefrom

3. The method of claim 2 wherein said preparing step includes the step of applying an angle to the first mating surface, said angle being an acute angle defined from a normal to a longitudinal axis of the waveguide.

4. The method of claim 3 wherein said acute angle is equal to about 8 degrees.

5. The method of claim 3 wherein said angle applying step includes the steps of lapping and polishing the first mating surface.

6. The method of claim 5 where said angle applying step further comprises the step of filling said gap with material prior to performing the lapping and polishing steps to prevent chipping of the PLC.

7. The method of claim 6 further comprising the step of removing said material from the gap prior to applying the adhesive.

8. The method of claim 6 wherein said material is mounting wax.

9. The method of claim 1 wherein the aligning step includes the step of aligning the waveguide and the optical fiber end faces in at least one translational and at least one angular direction while measuring a change in optical transmission arising over the optical path between the waveguide and the optical fiber end faces.

10. The method of claim 1 wherein the aligning step includes the step of aligning the waveguide and the optical fiber end faces in three translational and three angular directions while measuring a change in optical transmission arising over the optical path between the waveguide and the optical fiber end faces.

11. The method of claim 1 further comprising the step of applying an antireflective coating to the first mating surface.

12. The method of claim 1 further comprising the step of securing a second joint element to a second surface of the PLC waveguide opposing said first surface, said second joint element having a beveled surface such that a second gap is formed between the second joint element and the second surface of the waveguide, said second gap being adjacent to said end face of the waveguide such that said first mating surface further includes a transverse surface of the second joint element, whereby adhesive that would otherwise enter the optical path between the waveguide end face and the optical fiber end face is diverted into said gaps.

13. The method of claim 1 wherein said support member includes a groove in which the optical fiber is situated.

14. An optical device formed in accordance with the method of claim 1.

15. An optical device, comprising:

a PLC that includes at least one waveguide formed thereon;

at least one joint element secured to a first surface of the PLC, said joint element having a beveled surface such that a gap is formed between the joint element and the first surface of the PLC, said gap being adjacent to an end face of the waveguide, said waveguide end face extending in a plane that includes a transverse surface of the joint element to define therewith a first mating surface;

a support member;

an optical fiber secured to said support member, said optical fiber having an end face that extends in a plane that includes a transverse surface of the support member to define a second mating surface therewith, said waveguide and said optical fiber being in optical alignment with one another; and

an adhesive securing together the first and second mating surfaces, said adhesive being substantially absent in an optical path located between the waveguide end face and the optical fiber end face.

16. The optical device of claim 15 wherein said transverse surface of the joint element has a length at least about 850/125 times greater than a cross-sectional dimension of the optical fiber.

17. The optical device of claim 15 wherein the joint element is formed from fused silica.

18. The optical device of claim 15 wherein said first mating surface forms an acute angle defined from a normal to a longitudinal axis of the waveguide.

19. The optical device of claim 18 wherein said acute angle is equal to about 8 degrees.

20. The optical device of claim 15 further comprising an antireflective coating formed on the first mating surface.

21. The optical device of claim 15 further comprising a second joint element secured to a second surface of the PLC opposing said first surface, said second joint element having a beveled surface such that a second gap is formed between the second joint element and the second surface of the PLC, said second gap being adjacent to said end face of the PLC such that said first mating surface further includes a transverse surface of the second joint element, whereby adhesive that would otherwise enter the optical path between the waveguide end face and the optical fiber end face is diverted into said gaps.

22. A method for attaching an optical fiber to a waveguide formed on a PLC, said method comprising the steps of:

securing the optical fiber to a support member such that an end face of the optical fiber extends in a plane that includes a transverse surface of the support member to define a second mating surface therewith;

aligning an end face of the waveguide with the optical fiber end face; and

securing at least one joint element to a first surface of the PLC, said waveguide having an end face extending in a plane that includes a transverse surface of the joint element to define therewith a first mating surface;

applying an adhesive to an interface defined between the first and second mating surfaces so that the first and second mating surfaces are fixed together;

conducting excess adhesive from the interface and into a reservoir formed at least in part by the joint element before said excess adhesive enters an optical path located between the waveguide end face and the optical fiber end face.

23. The method of claim 22 wherein said reservoir is formed by the joint element and said first surface of the PLC.

24. The method of claim 22 further comprising the step of preparing the first mating surface for reducing reflections therefrom

25. The method of claim 24 wherein said preparing step includes the step of applying an angle to the first mating surface, said angle being an acute angle defined from a normal to a longitudinal axis of the waveguide.

26. The method of claim 25 wherein said acute angle is equal to about 8 degrees.

27. The method of claim 25 wherein said angle applying step includes the steps of lapping and polishing the first mating surface.

28. The method of claim 25 where said angle applying step further comprises the step of filling said gap with material prior to performing the lapping and polishing steps to prevent chipping of the PLC.

29. The method of claim 28 further comprising the step of removing said material from the gap prior to applying the adhesive.

30. The method of claim 28 wherein said material is mounting wax.

31. The method of claim 22 wherein the aligning step includes the step of aligning the waveguide and the optical fiber end faces in at least one translational and at least one angular direction while measuring a change in optical transmission arising over the optical path between the waveguide and the optical fiber end faces.

32. The method of claim 22 wherein the aligning step includes the step of aligning the waveguide and the optical fiber end faces in three translational and three angular directions while measuring a change in optical transmission arising over the optical path between the waveguide and the optical fiber end faces.

33. The method of claim 22 further comprising the step of applying an antireflective coating to the first mating surface.

34. The method of claim 22 further comprising the steps of:

securing a second joint element to a second surface of the PLC opposing said first surface,

applying an adhesive to said interface in a vicinity of the second joint element;

conducting excess adhesive from the interface and into a second reservoir formed at least in part by the second joint element before said excess adhesive enters said optical path located between the waveguide end face and the optical fiber end face.

35. The method of claim 22 wherein said support member includes a groove in which the optical fiber is situated.

36. An optical device formed in accordance with the method of claim 22.